



U.S. DEPARTMENT OF TRANSPORTATION

FEDERAL HIGHWAY ADMINISTRATION

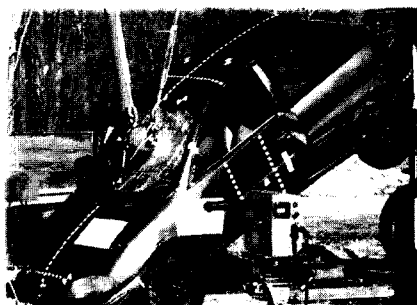
SAFETY

Is that "More Secure" Mailbox Really Safe?

With mailbox vandalism and identity theft from stolen mail on the rise, many homeowners opt for the newer, heavier mailbox designs that promise security. However, little is known about how these heavier mailboxes could impact drivers and passengers in car crashes.

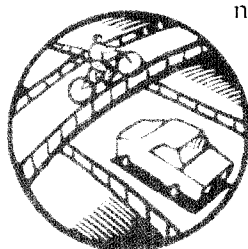
The Federal Highway Administration (FHWA) Office of Safety Design and the American Association of State Highway and Transportation Officials' (AASHTO) Task Force for Roadside Safety are concerned that these new heavyweight mailbox designs could contribute to serious motorist injury. To study the effects of mailbox impacts they have turned to the FHWA/NHTSA National Crash Analysis Center (NCAC) and the Federal Outdoor Impact Lab (FOIL). The FOIL crew will conduct a series of pendulum tests on the windshields of passenger automobiles.

Prior to each pendulum test, a grid of white tape is placed over the curved windshield and the FOIL team scans it with a digitizing arm to measure the initial location of each nodal point. A pendulum test

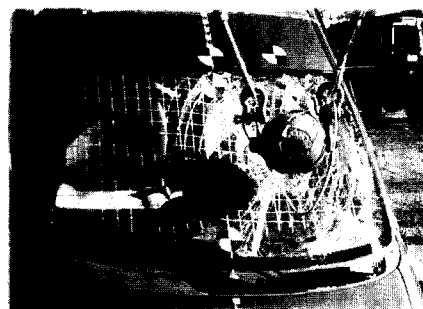


Windshield after pendulum test with steel ball shows crack patterns and deformations. The test data will be used to make a windshield model for finite element analysis.

device swings a heavy steel ball into the windshield. An accelerometer mounted on the steel ball measures the actual impact force and the loading time history. After the test, the team measures the displaced positions of each node with a digitizing arm.



The FOIL team will run a series of pendulum tests at different speeds and impact locations on the windshield. A few full-scale tests with the secure mailboxes will also be used in the validation process. To date, four pendulum tests were conducted, and as weather permits, the remainder of the tests will be run over the next few months.



The cracks on the windshield radiating outward from the point of impact and the deflection of the nodes on the grid will be scanned into a computer.

NCAC will use the pendulum test data to develop a finite element model of a windshield, which they will use to evaluate the potential for windshield cracking and penetration under various impact scenarios. To do this, they must develop a material model that accurately represents the material properties of laminated glass.

Upon completion of the study, FHWA will make the results available to the AASHTO Task Force for Roadside Safety in order to develop secure mailbox accommodation guidelines. For additional information, contact:
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RESEARCH & TECHNOLOGY TRANSPORTER

The *Research and Technology Transporter* communicates FHWA research, development, and technology accomplishments, findings, information, and technology transfer opportunities. Its audience is transportation engineers and professionals in State and local highway agencies, State DOTs, Local Technical Assistance Programs, Divisions, Resource Centers, Core Business Units, academia, and the research community. The eight-page newsletter is published monthly by FHWA's RD&T service business unit. Editorial offices are housed at the Turner-Fairbank Highway Research Center. Comments should be sent to the managing editor at the address below. Field offices are encouraged to submit articles for publication via the appropriate agency technology leader from the editorial board listed below. The newsletter can be viewed online at www.tfhrc.gov. Subscriptions to the *Transporter* are free. Send your request to Judy Dakin at the address below, or send e-mail to judy.dakin@fhwa.dot.gov.

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INFRASTRUCTURE

New Geotechnical Database Alleviates Frustration in Gathering Info for Deep Foundation Design

Piles are vital to the structural support of most bridge, roadway, and retaining wall foundations; however, before installing that first pile, engineers often research and compare information about piles driven under similar situations, soil conditions, and pile designs. They seek information about the test load capacities of different piles; pile failure statistics; soil liquefaction and water tables; soil types and stability; regional geography and climate; and more. Unfortunately, many spend an inordinate amount of time trying to find the information they need to build safe and lasting foundations. Until recently, there wasn't a searchable, central repository of information for engineers to use in their assessments of soil and pile behavioral impact on projects similar to their own.

In cooperation with other geotechnical organizations, the Federal Highway Administration (FHWA) Geotechnical Laboratory, began work on the Automated Geotechnical Information and Design-Aid System (AGIDS). AGIDS attempts to integrate FHWA research-quality geotechnical information and the latest design improvements into a centrally-located system of databases, allowing bridge engineers and researchers to quickly obtain information and evaluate design alternatives for different pile and soil types. In short, AGIDS will take most of the frustration out of

obtaining information needed for deep foundation design.

Once completed, the AGIDS system will include searchable databases for shallow foundations, deep foundations, National Geotechnical Experimental Sites (NGES), publications, bridge inventories, and ground improvements. Engineers can presently access the deep foundation database over the Internet and can start performing correlations, predictions, and analyses.

An ongoing pooled fund study (TPF-5(038)) on AGIDS will broaden and enhance the database, and provide a means for its maintenance and upgrade. For more information about or access to the AGIDS online database, visit www.tfhrc.gov/structur/agids/agids.htm.

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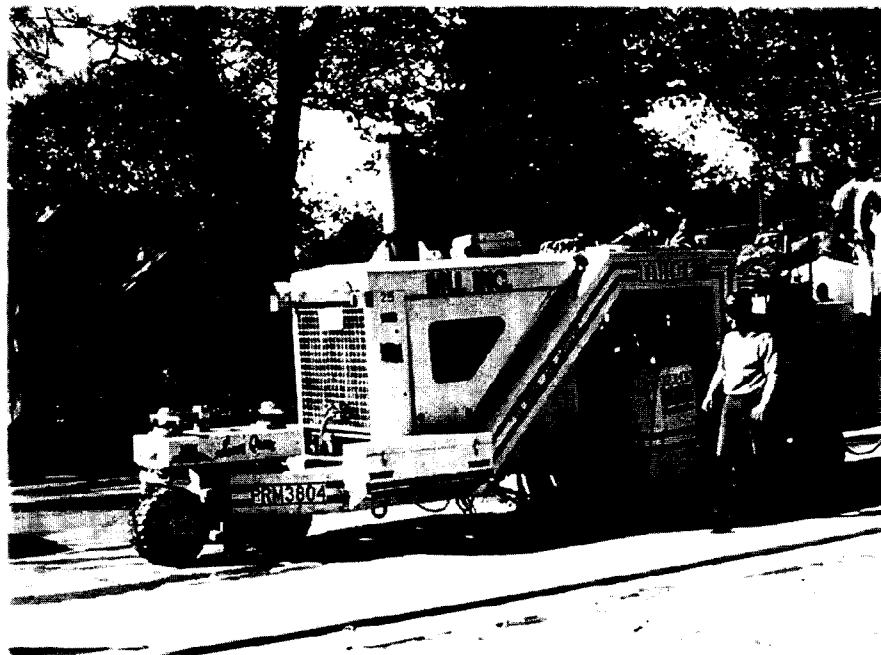
Sparks fly off the H-pile as a technician preps it for installing strain-gauge instrumentation.

Diamond Grinding on the Rough Extends Pavement Life

Concrete pavements wear, crack, and fault over time. Constant use and weather conditions often mean that those who maintain highways are faced with a difficult choice: to replace, or try to rehabilitate the pavement. As a pavement restoration technique, diamond grinding offers several benefits: it costs much less than an overlay; it improves safety by enhancing surface friction; and it causes minimal interference with traffic during repairs.

On a pavement surface, diamond grinding removes a thin layer (4–6 mm) of hardened portland cement concrete using closely-spaced diamond saw blades. The blades cut tiny longitudinal grooves in the faulted pavement and provide texture as the grinding smooths down surface irregularities caused by construction curling, slab warping, faulting, and other Concrete Pavement Rehabilitation (CPR) construction work roughness. Diamond grinding removes faults by leveling a pavement surface, and supplies motorists with a quieter surface by removing the thumping and slapping sound created by faulted joints. It also provides a temporary increase in skid friction resistance and a reduction in the potential for hydroplaning, thereby improving the overall safety of the road.

The Federal Highway Administration Office of Pavement Technology and the Southern Resource Center jointly developed a Technical Bulletin, *Concrete Pavement Rehabilitation—Guide for Diamond Grinding*, which recommends procedures for



This diamond grinding machine grates a thin layer of concrete, and removes faults by leveling the pavement surface.

selecting, designing, and constructing diamond grinding projects for portland cement concrete pavements.

Reasons to select this type of rehabilitation include removing transverse joint and crack faulting, smoothing out construction roughness, adding friction to a polished surface, removing permanent upward slab warping at joints, improving transverse slope for better drainage, and removing wheel path rutting caused by studded tire wear on a surface. Applying the diamond grinding rehabilitation method extends pavement life and durability and can be performed during off-peak traffic hours, although it should be used in conjunction with other CPR techniques. A full CPR job can restore structural and

functional capacity of a pavement to acceptable levels for a specific traffic need.

The *Concrete Pavement Rehabilitation—Guide for Diamond Grinding Technical Bulletin* publication number is: FHWA-SRC 1/10-01(5M). For more information and copies of the bulletin, contact **Bing Wong** 202-366-2169 bing.wong@fhwa.dot.gov



The diamond saw blade makes small longitudinal grooves in the pavement.

FHWA Field Pavement Engineers Gather in Washington

Last December, the Federal Highway Administration's (FHWA) Turner-Fairbank Highway Research Center (TFHRC) hosted the Second Annual Pavement and Materials Field Engineers Workshop. Pavement and materials engineers from the FHWA Resource Centers, Federal Lands Division, and from 25 Division offices across the nation gathered to participate in and learn about subject matter, which had been identified at the previous year's workshop as the topic of the meeting. They also exchanged information and ideas, which the

engineers might apply in the field.

The three-day workshop was cosponsored by the FHWA Office of Pavement Technology and Office of Infrastructure, Research & Development with the focus on the *2002 Pavement Design Guide* being developed under Project 1-37A of the National Cooperative Highway Research Program (NCHRP). Much of the workshop was led by the two lead researchers from NCHRP 1-37A: Matt Witczak, who leads the development of the flexible design procedures, and Mike Darter, who leads the development

of the rigid design procedures.

In addition to the content in the *2002 Pavement Design Guide*, discussions also included what users could do to start familiarizing themselves with and preparing for the design guide, and FHWA's role in its implementation. For more details, contact:

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OPERATIONS

2003 ITS Deployment Preliminary Applications Due April 1st

January 29, 2002, notice in the Federal Register solicits preliminary applications for the FY 2003 Intelligent Transportation Systems (ITS) Deployment Program.

In light of recent events, the focus of the FY 2003 Program will be to provide incentive monies for deployment and/or integration of ITS to enhance the security of America's surface transportation systems. Such ITS technologies could include: innovative surveillance technologies and applications with potential to monitor critical infrastructure, identification of potential risks to these critical elements, and immediate reporting of changes in their status; technologies that provide improved coordinated responses to identified security

incidents through improved traffic management, traveler information, transit system management, and/or public safety coordination; and technologies that ensure secure operation of commercial motor vehicles, their drivers, and their cargo, as well as improved communication networks and systems that better identify high-risk commercial vehicles or drivers.

Preliminary applications will be evaluated on the following criteria: evidence of strong partnerships among agencies, jurisdictions, and private sector organizations as appropriate; the degree to which the technical approach will further transportation security, or in the case of commercial vehicle operations, the degree to which safety, productivity, and cost

reduction will be improved; conformance with TEA-21 requirements; and a financial summary that demonstrates sufficient funding to complete all aspects of the technical plan.

In its budget request to Congress, the Department requested \$93 million for the FY 2003 ITS Deployment Program, including integration projects (metro and rural areas) and commercial vehicle projects. The preliminary applications to determine qualifications for participation are due April 1—60 days following publication of the Federal Register notice. For additional information, go to www.its.dot.gov.

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Coalition Publishes Implementation Guidelines for 511 National Traffic and Traveler Information

According to an article in *USA Today*, traffic jams cost \$74 billion in lost productivity and wasted fuel in 70 major U.S. cities. Motorists listening to the radio don't receive specific enough route information to help them avoid trouble spots, which adds to their driving frustration. To make matters worse, at last count there were 300 traveler information telephone numbers around the nation, making it even more difficult for gathering pertinent intrastate and interstate travel information. Fortunately for drivers, this situation is about to change for the better.

Very soon a motorist will only need to dial 3 digits to get the latest local traffic and traveler information—511. Upon full implementation, the 511 system will give travelers current information about bad weather, construction, traffic jams, and the status of local public transportation, including transit buses, ferries, and light rail. Optional features of a 511 system may also offer directions and other personalized functions to travelers.

To establish this system more swiftly, representatives from the American Association of State Highway and Transportation Officials (AASHTO), the Intelligent Transportation Society of America (ITS America), the Federal Highway Administration, and others formed a 511 Deployment Coalition to define the vision for 511 and to develop deployment guidelines. This new three-digit number took form after local and

State entities asked the Department of Transportation to petition the Federal Communications Commission (FCC), who assigned the number in July 2000 as a nationwide traveler information telephone number.

The 511 Deployment Coalition recently completed and published *Implementation Guidelines for Launching 511 Services*, a report presenting guidelines for making the basic content of travel information services consistent across the Nation. Transportation agencies in Kentucky, Utah, Minnesota, Nebraska, Arizona, San Francisco, and Virginia already have deployments under way or have implementation plans for the 511 service. To access the *Implementation Guidelines for Launching 511 Services* on the Internet, go to www.its.dot.gov/511/511_Guidelines.htm.

Mark your Calendars for the 511 Deployment Conference

The 511 Deployment Coalition is

sponsoring the *511 Deployment Conference: Answering America's Call for Travel Information*, on March 19–21 in Scottsdale, AZ. It will cover basic information about 511 up to the latest voice technologies available for 511 systems. Tabletop exhibits of industry leading organizations, available for demonstrations, will give attendees a look at the technologies powering 511—today and tomorrow. There will also be opportunities to meet and exchange information with wireline and wireless telecommunications carriers, and with transportation agencies that have already learned much about implementing 511 services in their regions. To obtain more information about the conference in March, please visit www.itsa.org/511.html.

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Pressing a few numbers—511—on a telephone will give travelers the information they need to make informed transportation decisions.

ROOs Create Regional Transportation Collaborations

Individual agencies or jurisdictions sometimes find it impossible to independently solve transportation issues, because the scope, impact, and repercussions are regional in nature. Addressing traffic congestion, air quality, and incident management, sometimes requires a coordinated approach involving multiple participants. Several metro areas and locales in North America are successfully combining public and private transportation establishments into Regional Operating Organizations (ROOs). These ROOs benefit by integrating personnel, resources, and technical systems, and solve traffic problems or services on a regional scale.

The Federal Highway Administration (FHWA) recently studied and released their findings about ROOs. The report, *Organizing for Regional Transportation Operations*, examined innovative approaches to regional transportation operations by NY/NJ/CT metropolitan area; Southern California stretching from Los Angeles to San Diego; and Houston, Phoenix, and Vancouver. Although these areas differ in regional size and characteristics, organizational structure, scope and geography, they share critical elements for success—visionary, influential leadership and a source of funding that supports coordinated regional efforts.

Organizing for Regional Operations is a product of FHWA's National Dialogue on Transportation Operations (www.nawgits.com/opdialog/) and was developed with assistance from the Federal Transit Administration (FTA) and the Institute of Transportation Engineers (ITE). The report debuted at the American Association of State Highway and Transportation Officials' annual meeting in Fort Worth, Texas, and is online at www.ite.org/library/reg_trans_ops.htm.
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POLICY

FHWA Changes Pooled Fund Program

When significant or widespread interest is shown in solving transportation-related problems, research, planning, and technology transfers can be jointly funded as a pooled fund study by Federal, State, regional, and local transportation agencies; academic institutions; foundations; or private firms. A Federal or State agency may initiate pooled fund studies. Regional or local transportation agencies, private companies, foundations, and colleges/universities may partner with any or all of the sponsoring agencies to conduct pooled fund projects.

The Federal Highway Administration (FHWA) recently

made three changes to the pooled fund program to increase its value as part of the national research and technology program. FHWA eliminated the "national" and "regional" labels; instituted an option for States to use the Transportation Research Board (TRB) or the FHWA to administer individual studies; and initiated the development of a website for soliciting participation, monitoring, and providing information about the projects.

Historically, FHWA-led national pooled fund studies were numbered SPR-2(###) and State-led regional studies were numbered SPR-3(###). These numbers are still active on many projects. The program reengineering establishes

a new numbering series, TPF-5(###), encompassing both FHWA- and State-led studies. For clarity, projects shall now be referred to as "FHWA-led" or "State-led."

A website being developed with the National Cooperative Highway Research Program is part of a transportation research-in-progress data system, expected to go online in Fall 2002. Visit www.tfhrc.gov/site/active.htm for current information.

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TECHNOLOGY INNOVATION

Portable Speed Bump Keeps a Safe Work Zone Around Flaggers

In most cases, motorists entering a work zone decrease the speed of their vehicles and drive more carefully; however, some drivers become frustrated or impatient with traffic delay, making flaggers susceptible to potential injury. In New York, alone, there were five flaggers struck in work zones last year.

Taking part in a program cosponsored by the Federal Highway Administration (FHWA) and the California Department of Transportation (CALTRANS), a Mexican engineer participating in the FHWA-funded CALTRANS-Baja California Personnel Exchange Program, created an imaginative new solution for making work, crash, and incident zones safer—portable speed bumps.

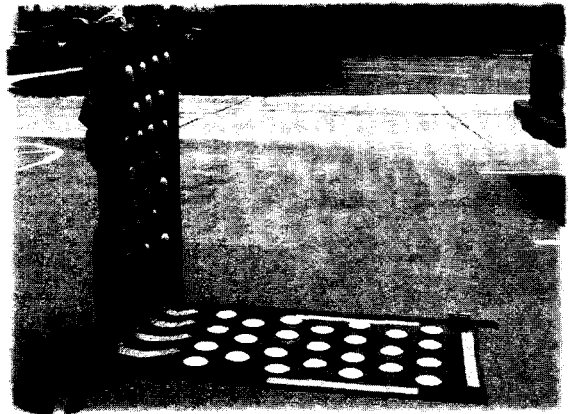
Called the Advance Traffic Warning System (ATWS), the speed bumps are actually an 11' x 3'6" (3.35 x 1.07 meter) mat made of a flexible, yet sturdy, rubber with a polyurethane backing, built around woven fiberglass. The mat thickness, reflective material, and reflective circular ceramic tiles act as rumble strips (like those often seen in crosswalks), and provide a compelling reason for drivers to decrease vehicle speed when approaching a flagger. Best of all, it's so portable, lightweight, and easy to handle that it can be quickly folded up and moved along work zones within minutes.

Other benefits of the portable speed bumps include resistance to water, grease, and oil. The

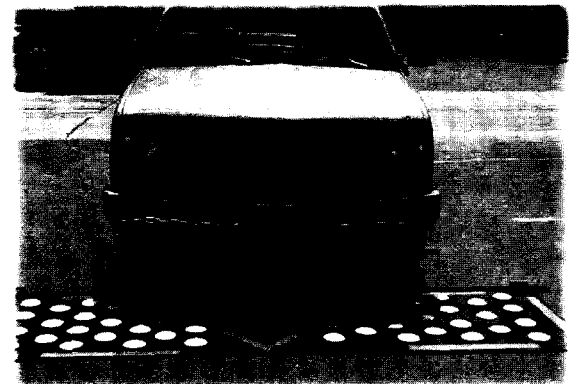
composit material remains flexible, even in freezing temperatures, and resists rips, tears, and cuts. The ATWS will sustain any direct pressure on it, and its highly reflective stripes and reflective coating enable workers to use the speed bumps at night.

Although not approved by CALTRANS, if proven effective, this ATWS speed bump invention could become one of many success stories from the U.S.-Mexico Border Technology Exchange Program (BTEP), created and funded by the FHWA Office of International Programs. The BTEP is a binational program headed by the FHWA and Mexico's counterpart, the Secretariat of Communications and Transportation (SCT), and it includes all 10 Departments of Transportation sharing the southwestern international border with Mexico.

Begun just before the North American Free Trade Agreement was passed, the BTEP program encourages a cross-cultural, multinational sharing of ideas and technology among Mexican municipal, State, and Federal transportation agencies. In the



Construction worker shows how easily the portable speed bump can be folded for movement from location to location or storage.



Portable speed bump acts like a rumble strip to slow the speed of a car driving over it.

case of California, the BTEP includes Metropolitan planning organizations, and universities from California and Baja. The fundamental philosophy of the BTEP is to train individuals from both countries to develop safer roads and to facilitate better coordination of Mexican and U.S. transportation-related projects.
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TRAINING

NHI Releases New Courses for 2002

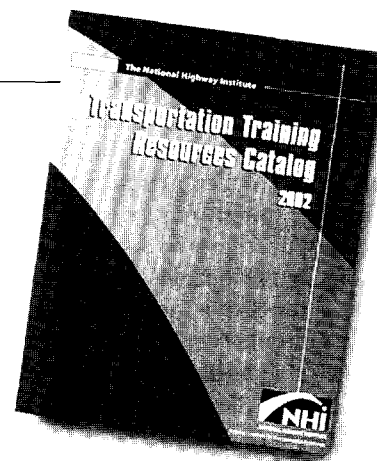
The National Highway Institute (NHI) just released its NHI Transportation Training Resources Catalog for 2002, which contains policy and technical courses for transportation professionals. To order a copy, contact the FHWA Report Center at 301-577-0818 or report.center@fhwa.dot.gov.

Two new courses in the catalog include:

- **Road Safety Audits and Road Safety Audit Reviews (Course #380069)**
Participants in this course discover how to improve transportation safety by learning how to apply Road Safety

Audits (RSA) and Road Safety Audit Reviews (RSAR) to planned or existing roadways. It should enable attendees to improve safety and keep the public informed about efforts to reduce the number of crashes.

- **Rural ITS Toolbox (Course #137007)**
This course describes and documents many Intelligent Transportation Systems (ITS) practices and techniques that were successfully applied to rural transportation problems. The Rural ITS Toolbox training helps to identify ITS solutions that feature a low-cost/high-return impact on rural transportation.



For more information about these courses, or about other courses available through NHI, please contact the NHI's course scheduler, at 703-235-0528, or visit the NHI website, at www.nhi.fhwa.dot.gov.
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